

In the claims:

1. (Previously Presented) A short range radio communication method, in which a DSRC (Dedicated Short Range Communication) that is a short range radio communication used for an ETC (Electronic Toll Collection) that is a non-stop toll collection system is applied, and roadside antennas that are provided at a roadside are continuously arranged, and time sharing operation is performed by synchronizing sending timing of a communication frame in all of said roadside antennas, comprising:

a step for receiving a communication frame transmitted from an adjacent roadside antenna during the communication with one of said roadside antennas in an on-vehicle device which is a radio set mounted on a vehicle and performs the communication with said roadside antennas; and

wherein said step comprises:

an FCMS detecting step for detecting an FCMS (Frame Control Message Slot) of the communication frame transmitted from said adjacent roadside antenna at stopping timing of the communicating roadside antenna; and

a step for switching the communication from the communicating roadside antenna to the adjacent roadside antenna on the basis of results detected by said FCMS detecting step.

2. (Cancelled)

3. (Original) The short range radio communication method according to claim 1,

wherein said roadside antennas are continuously arranged so that part of the effective communication range of each of said roadside antennas is overlapped onto the effective communication range of the adjacent roadside antenna, and said step is performed when said on-vehicle device exists in an overlapped part of said effective communication ranges.

4. (Original) The short range radio communication method according to claim 1, further comprising a DSRC control step for performing DSRC protocol processing in each of roadside devices, provided corresponding to said roadside antennas,

wherein said time sharing operation is performed by practicing synchronization among all DSRC control steps.

5. (Previously Presented) A short range radio communication system, in which a DSRC (Dedicated Short Range Communication) that is a short range radio communication used for an ETC (Electronic Toll Collection) that is a non-stop toll collection system is applied, and roadside antennas that are provided at a roadside are continuously arranged, and time sharing operation is performed by synchronizing sending timing of a communication frame in all of said roadside antennas, comprising:

an on-vehicle device which is a radio set mounted on a vehicle and performs the communication with said roadside antennas, wherein said on-vehicle device includes means for receiving a communication frame transmitted from an adjacent roadside antenna during the communication with one of said roadside antennas; and

wherein said receiving means comprises:

FCMS detecting means for detecting an FCMS (Frame Control Message Slot) of the communication frame transmitted from said adjacent roadside antenna at stopping timing of the communicating roadside antenna; and

means for switching the communication from the communicating roadside antenna to the adjacent roadside antenna on the basis of results detected by said FCMS detecting means.

6. (Cancelled)

7. (Original) The short range radio communication system according to claim 5,

wherein said roadside antennas are continuously arranged so that part of the effective communication range of each of said roadside antennas is overlapped onto the effective communication range of the adjacent roadside antenna, and said means receives the communication frame from the adjacent roadside antenna when said on-vehicle device exists in an overlapped part of said effective communication ranges.

8. (Original) The short range radio communication system according to claim 5, wherein each of roadside devices provided corresponding to said roadside antennas includes a DSRC control section for performing DSRC protocol processing, and said time sharing operation is performed by practicing synchronization among all DSRC control sections.

9. (Original) The short range radio communication system according to claim 5, wherein the communication contents which are concurrently taken in a communication frame from the communicating roadside antenna and a communication frame from the adjacent roadside antenna are mutually different communication contents.

10. (Currently Amended) A short range radio communication method for use in a DSRC (Dedicated Short Range Communication) system using an ETC (Electronic Toll Collection), said method comprising the steps of:

arranging a plurality of roadside antennas along a direction of travel of vehicles utilizing a roadway; said plurality of antennas spaced from one another in the direction of vehicle travel such that a given antenna among said plurality of antennas has a communication range along said direction of travel that overlaps with a communication range along said direction of travel of adjacent antennas among said plurality of antennas;

time sharing an operation of said plurality of roadside antennas by synchronizing sending timing of a communication frame in each of said plurality of roadside antennas; and

receiving a communication frame transmitted from one of said adjacent roadside antennas during communication with said given one of said roadside antennas in an on-vehicle device which includes a radio set mounted on a vehicle for performing communication with said roadside antennas; and

wherein said receiving step comprises:

detecting an FCMS (Frame Control Message Slot) of the communication frame transmitted from said adjacent roadside antenna at a stopping time interval of communication by said given roadside antenna; and

switching the communication from the given roadside antenna to the adjacent roadside antenna on the basis of results said FCMS detecting.

11. (Cancelled)

12. (Previously Presented) The short range radio communication method according to claim 10, further comprising:

a DSRC control step for performing DSRC protocol processing in each of a plurality of roadside devices which are provided corresponding to said plurality of roadside antennas, and

wherein said time sharing operation is performed by practicing synchronization among all of said plurality of roadside devices.

13. (Currently Amended) A short range radio communication system for use in a DSRC (Dedicated Short Range Communication) system using an ETC (Electronic Toll Collection), said system comprising:

a plurality of roadside antennas positioned along a direction of travel of a vehicle utilizing a roadway; said plurality of antennas spaced from one another in the direction of vehicle travel such that a given antenna among said plurality of antennas has a communication range along said direction of travel that overlaps with a communication range along said direction travel of at least one adjacent antenna among said plurality of antennas;

means for time sharing an operation of said plurality of roadside antennas by synchronizing sending timing of communication frames from said plurality of roadside antennas; and

an on-vehicle device comprising a radio set mounted on said vehicle and performing communication with said plurality of roadside antennas, wherein said on-vehicle device

includes means for receiving one of said communication frames transmitted from said given roadside antenna and for receiving another of said communication frames from said at least one adjacent antenna in a time share manner; and

wherein said receiving means comprises:

detecting means for detecting an FCMS (Frame Control Message Slot) of the other communication frame transmitted from said at least one adjacent roadside antenna at a stopping time of said one communication frame from said given roadside antenna ; and

means for switching the communication from the given roadside antenna to the adjacent roadside antenna on the basis of results detected by said FCMS detecting means.

14. (Cancelled)

15. (Previously Presented) The short range radio communication system according to claim 13,

wherein said receiving means receives the other communication frame from the adjacent roadside antenna when said on-vehicle device is present in an overlapped communication range of said given antenna with said at least one adjacent antenna.

16. (Previously Presented) The short range radio communication system according to claim 13,

wherein each of said plurality of roadside antennas are provided with a device which includes a DSRC control section for performing DSRC protocol processing, and said time sharing operation is performed by synchronizing all of said DSRC control sections.

17. (Previously Presented) The short range radio communication system according to claim 13,

wherein a communication content transmitted by said given antenna in said one communication frame is different from the communication content transmitted by said at least one adjacent antenna in said another communication frame.